

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1 **Claim 1.** (Currently amended) A method of extracting structural information from a NMR  
2 data set for a selected macromolecule in an intact biological compartment wherein said selected  
3 macromolecule is labeled with ~~an~~ a NMR-detectable nucleus, such that said NMR-detectable  
4 nucleus is present in said selected macromolecule in an amount greater than is naturally abundant  
5 in said macromolecule, said method comprising:

6 (a) contacting said intact biological compartment with radio frequency energy, thereby  
7 producing an excited NMR-detectable nucleus;

8 (b) collecting radio frequency data from said excited NMR-detectable nucleus, thereby  
9 producing said NMR data set, and

10 (c) analyzing said data set to extract said structural information from the NMR data set  
11 for said selected macromolecule ~~from said data set~~.

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1 **Claim 2.** (Currently amended) The method according to claim 1, wherein said selected  
2 macromolecule is overexpressed in said intact biological compartment.

1 **Claim 3.** (Currently amended) The method according to claim 1, wherein said NMR-  
2 detectable nucleus is present in an amount detectable by NMR of said intact biological  
3 compartment.

1 **Claim 4.** (Original) The method according to claim 1, wherein said selected  
2 macromolecule is a member selected from the group consisting of proteins, saccharides,  
3 glycoproteins, and nucleic acids.

1 **Claims 5. - 8.** (Cancelled)

1 **Claim 9.** (Currently amended) The method according to claim 1, wherein said selected  
2 macromolecule is further labeled with deuterium.

1 **Claim 10.** (Currently amended) The method according to claim 1, wherein said intact  
2 biological compartment is present in a suspension.

1 **Claim 11.** (Original) The method according to claim 1, wherein said structural information  
2 is conformational information.

1 **Claims 12. - 13.** (Cancelled)

1 **Claim 14.** (Original) The method according to claim 1, wherein said structural information  
2 is for a first conformation of said selected macromolecule and a second conformation of said  
3 selected macromolecule.

1 **Claim 15.** (Original) The method according to claim 1, wherein said data set is acquired by  
2 a triple resonance NMR method.

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1 **Claim 16.** (Original) The method according to claim 15, wherein said triple resonance NMR  
2 experiment is a member selected from HSQC and TROSY.

1 **Claim 17.** (Currently amended) The method according to claim 1, wherein said intact  
2 biological compartment is prepared by a method comprising:

3 (a) transforming an unlabeled precursor of said ~~labeled~~ intact biological compartment  
4 with a nucleic acid encoding said selected macromolecule, wherein said nucleic  
5 acid is operably linked to a promoter non-native to said unlabeled precursor cell  
6 of said intact biological compartment, thereby producing a transformed intact  
7 biological compartment;

8 (b) incubating said transformed intact biological compartment in a medium comprising  
9 said NMR-detectable nucleus; and

10 (c) inducing said transformed intact biological compartment, thereby preparing said  
11 ~~labeled~~-intact biological compartment.

1 **Claim 18.** (Currently amended) The method according to claim 17, further comprising:

2 (d) inhibiting essentially all transcription in said transformed intact biological  
3 compartment, which is under control of promoters native to said unlabeled

4 precursor of said intact biological compartment, while allowing transcription  
5 under control of said non-native promoter to proceed.

1 **Claim 19.** (Cancelled)

1 **Claim 20.** (Original) The method according to claim 17, wherein said medium is deuterated.

1 **Claim 21.** (Currently amended) The method according to claim 17, wherein said intact  
2 biological compartment is a bacterial cell.

1 **Claim 22.** (Original) The method according to claim 17, wherein the non-native promoter  
2 encodes an RNA polymerase that is operable during step (d).

1 **Claim 23.** (Original) The method according to claim 17, wherein the non-native promoter is  
2 a phage promoter.

1 **Claim 24.** (Currently amended) The method according to claim 18, wherein said inhibiting  
2 is caused by administering an inhibitor to said unlabeled precursor of said intact biological  
3 compartment in an amount sufficient to cause said inhibiting.

1 **Claim 25.** (Original) The method according to claim 24, wherein said inhibitor is  
2 rifampicin.

1 **Claim 26.** (Currently amended) The method of claim 1, wherein ~~said selected~~  
2 ~~macromolecule experiences a local~~ the viscosity inside said intact biological compartment is at  
3 least 2 fold greater than the viscosity of pure water, wherein said local viscosity inside said intact  
4 biological compartment and said viscosity of said pure water are determined at the same  
5 temperature.

1 **Claim 27.** (Currently amended) The method of claim 1, wherein said selected  
2 macromolecule is present in said intact biological compartment at a weight percent of up to 0.3%  
3 compared to the total weight of said intact biological compartment.

1 **Claim 28.** (Currently amended) The method of claim 1, wherein said selected  
2 macromolecule is present in said intact biological compartment at a weight percent of up to 50%  
3 compared to the total weight of said intact biological compartment.

1 **Claim 29.** (Original) The method of claim 1, wherein said selected macromolecule has a  
2 molecular weight of at least 5 kDa.

1 **Claim 30.** (Original) The method of claim 1, wherein said selected macromolecule has a  
2 molecular weight of at least 25 kDa.

1 **Claim 31.** (Original) The method of claim 1, wherein said selected macromolecule has a  
2 molecular weight of at least 70 kDa.

1 **Claim 32.** (Currently amended) The method of claim 1, wherein said intact biological  
2 compartment is a living cell.

1 **Claim 33.** (Currently amended) The method of claim 1, wherein said intact biological  
2 compartment is a cell that has been metabolically arrested.

1 **Claim 34.** (Original) The method of claim 1, wherein said selected macromolecule is  
2 expressed from a plasmid.

1 **Claim 35.** (Original) The method of claim 1, using a multidimensional multinuclear  
2 method.

1 **Claim 36.** (Currently amended) The method of claim 35, ~~using an HNCA experiment~~  
2 wherein said multidimensional multinuclear method is an HNCA experiment.

1 **Claim 37.** (Currently amended) The method of claim 35, ~~using an HMQC experiment~~  
2 wherein said multidimensional multinuclear method is an HMQC experiment.

1 **Claim 38.** (Currently amended) The method of claim 1, wherein said intact biological  
2 compartment is a biological cell.

1 **Claim 39.** (Currently amended) The method of claim 38, wherein said biological cell is a  
2 prokaryotic cell.

1 **Claim 40.** (Currently amended) The method of claim 39, wherein said prokaryotic cell is a  
2 an *E. coli* cell.

1 **Claim 41.** (Currently amended) The method of claim 38, wherein said biological cell is a an  
2 eukaryotic cell.

1 **Claim 42.** (Currently amended) The method of claim 41, wherein said eukaryotic cell is a  
2 yeast cell.

1 **Claim 43.** (Currently amended) The method of claim 41, wherein said eukaryotic cell is a  
2 mammalian cell.

1 **Claim 44.** (Currently amended) The method of claim 43, wherein said mammalian cell is a  
2 human cell.

1 **Claims 45. - 88.** (Cancelled)

1 **Claim 89.** (New) The method of claim 1, wherein said structural information is a  
2 representation of a conformation of a selected macromolecule at a resolution sufficient to  
3 determine the relative locations of two or more atoms.

1 **Claim 90.** (New) The method of claim 1, wherein said intact biological compartment is not  
2 immobilized.

1 **Claim 91.** (New) A method of extracting structural information from a NMR data set for a  
2 selected macromolecule in an intact biological compartment, wherein said selected  
3 macromolecule is labeled with sufficient NMR-detectable nuclei in order to be detectable by an  
4 NMR instrument, said method comprising:

5 (a) contacting said intact biological compartment with radio frequency energy, thereby  
6 producing an excited NMR-detectable nucleus;

- 7 (b) collecting radio frequency data from said excited NMR-detectable nucleus, thereby  
8 producing said NMR data set, and  
9 (c) analyzing said data set to extract said structural information from the NMR data set  
10 for said selected macromolecule.
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